Claims

1. A method for controlling overload in a packet switched network comprising traffic sources (A), traffic destinations (B), and network nodes (AN, N1), the method comprising the steps of

5   - sending data units from a traffic source to a traffic destination,

- sending an acknowledgment from the destination to the source, if a data unit is received correctly at the destination, and

- measuring load level in at least one network node,

c h a r a c t e r i z e d by

10   transmitting duplicate acknowledgments in the direction of the traffic source when the measured load level exceeds a predetermined threshold.

2. A method according to claim 1, c h a r a c t e r i z e d in that said duplicate acknowledgments are generated in the same network node where the load level is measured.

15   3. A method according to claim 1, c h a r a c t e r i z e d in that said duplicate acknowledgments are generated in a different network node than where the load level is measured.

4. A method according to claim 3, c h a r a c t e r i z e d in that said duplicate acknowledgments are generated in an access node (AN, ANS, AND)

20   providing the traffic sources and destinations access to the network, and the load level is measured in at least one network node (N1) located within the network.

5. A method according to claim 4, wherein the network between the access nodes is an ATM network, c h a r a c t e r i z e d by the steps of

25   - transporting load level information in RM cells to the access node, and

- generating the duplicate acknowledgments on the basis of the information contained in the RM cells.

6. A method according to claim 1, c h a r a c t e r i z e d in that said

30   duplicate acknowledgments are generated in a network node by modifying the contents of successive incoming acknowledgments before transmitting them towards the traffic source.

7. A method according to claim 6, c h a r a c t e r i z e d in that duplicate acknowledgments are transmitted towards the traffic source as long as

35   the measured load level remains higher than the predetermined threshold.

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8. A method according to claim 6, c h a r a c t e r i z e d in that at most a predetermined fixed number of successive duplicate acknowledgments are transmitted towards the traffic source during a period when the measured load level is higher than the predetermined threshold.

5   9. A method according to claim 8, c h a r a c t e r i z e d in that after said predetermined fixed number of successive duplicate acknowledgments have been transmitted towards the traffic source, a new sequence of duplicate acknowledgments is started by generating duplicates of the next incoming acknowledgment.

10   10. A method according to claim 1, c h a r a c t e r i z e d in that at least part of said duplicate acknowledgments are generated by producing totally new acknowledgments which are copies of previously transmitted acknowledgments.

        11. A method according to claim 10, c h a r a c t e r i z e d by

15   - transmitting a fixed number of said new acknowledgments towards the traffic source immediately when the measured load level exceeds a predetermined threshold, and

        - discarding a corresponding number of succeeding acknowledgments arriving at the node from the traffic destination.

20   12. A method according to claim 1, wherein said data units travel along a forward path from the traffic source to the traffic destination and said acknowledgments travel along a backward path from the destination to the source, c h a r a c t e r i z e d by the steps of

        - measuring load level both on the forward path and on the back-

25 ward path and

        - transmitting duplicate acknowledgments towards the traffic source only when the measured load level on the forward path is higher than a first predetermined value and the measured load level on the backward path is higher than a second predetermined value.

30   13. A method according to claim 12, c h a r a c t e r i z e d by delaying acknowledgments when the load level on the forward path is higher than the first predetermined value and the load level on the backward path is lower than the second predetermined value.

        14. A method according to claim 1, c h a r a c t e r i z e d by gener-

35 ating of duplicate acknowledgments only on selected connections.

15. A packet switched telecommunications network including
- nodes interconnected by transmission lines (TL1, TL2),
- user terminals (UT) connected to the nodes, said user terminals acting as traffic sources which send data packets and as traffic destinations which receive data packets, and
- measuring means (LMU) for measuring current load level in a node,
characterized in that the network further includes
- duplicating means (CU), responsive to the measuring means (LMU), for generating duplicates of data packets carrying acknowledgments from a destination towards a source when the measured load level exceeds a predetermined threshold.

16. A network according to claim 15, characterized in that at least one node comprises both the measuring means and the duplicating means.

17. A network according to claim 16, characterized in that said at least one network node is an access node connecting at least one user terminal to the network.

18. An IP network according to claim 16, wherein the network nodes switch IP packets, characterized in that said at least one network node can be any one or more of the network nodes.

19. A TCP over ATM network according to claim 15, characterized in that the duplicating means are connected to the measuring means by an RM cell flow, said RM cells carrying information on the load level.

20. A node arrangement in a packet switched telecommunications network, the node arrangement including
- buffering means for buffering data packets traveling through the node, whereby at least part of the data packets are acknowledgment packets and
- measuring means (LMU) for measuring current load level in the node, characterized in that the node arrangement further includes duplicating means (CU), responsive to the measuring means (LMU), for generating duplicates of acknowledgment packets transferred through the node when the measured load level exceeds a predetermined threshold.